

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

REC'D 05 MAY 2004



WIPO of International  
Preliminary Examination Report (Form PCT/PEA/416)

Applicant's or agent's file reference =====	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/01596	International filing date (day/month/year) 14.04.2003	Priority date (day/month/year) 16.04.2002
International Patent Classification (IPC) or both national classification and IPC E21B21/10		
Applicant SPECIALISED PETROLEUM SERVICES GROUP LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  27.10.2003	Date of completion of this report  03.05.2004
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Schouten, A  Telephone No. +31 70 340-4088  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/01596

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-14 as originally filed

**Claims, Numbers**

1-22 received on 09.04.2004 with letter of 09.04.2004

**Drawings, Sheets**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/01596

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	18-22
	No: Claims	1-17
Inventive step (IS)	Yes: Claims	18-22
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1) In light of the documents cited in the international search report, and in light of the subsequent amendments made by the applicant, it is considered that the invention as claimed in at least one of the independent claims does not appear to meet the criteria mentioned in Article 33 (1) PCT, i.e. does not appear to be novel.

Dependent claims can only meet the PCT requirements when related to independent claims complying with Article 33 (1) PCT.

2) The document US-A-6.161.632 discloses in column 5, line 39-49; column 8, line 1-39 and column 11, line 26 - column 12, line 3 (the references in parentheses applying to this document):

A hydraulically activated downhole tool for use in a well bore (11) comprising:

- a hydraulically operated tool (the motor/drill head mentioned in column 5, line 39-40) including a hydraulically operating mechanism (the motor) controlled by fluid pressure; and
- a control sub (20) comprising a tubular assembly having a through passage between an inlet and a first outlet, the inlet being adapted (22) for connection on a workstring, the first outlet being adapted (24) for connection to a hydraulically operated downhole tool, one or more radial outlets (29, 30) extending generally transversely of the tubular assembly, an obturating member (21) moveable between a first position (Fig. 3) permitting fluid flow through the one or more radial outlets (29, 30) and a second position (Fig. 2) closing the one or more radial outlets (29, 30),
- wherein the obturating member (21) is moved from the first position (Fig. 3) to the second position (Fig. 2) by a compressive force applied from hydraulically operated tool; and
- movement of the obturating member (21) regulates the fluid pressure from the first outlet to hydraulically control the hydraulically operated tool (see column 11, line 42-54).

The subject-matter of independent claim 1 is therefore not new (Article 33(2) PCT).

Please note that there are no technical features distinguishing the apparatus as disclosed in US-A-6.161.632 from the hydraulically activated downhole tool as claimed

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB03/01596

in independent claim 1. The apparatus as disclosed in US-A-6.161.632 is therefore considered to be suitable for regulating the fluid pressure (see column 6, line 8-12) to hydraulically control the hydraulically operated tool as claimed in independent claim 1.

3) Dependent claims 2-17 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see documents US-A-6.161.632 and the corresponding passages cited in the search report or the claimed features are merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

4) In light of the documents cited in the international search report, and in light of the subsequent amendments made by the applicant, it is considered as obvious that the invention as claimed in the independent method claims 18 and 21 meets the criteria mentioned in Article 33(1) PCT, i.e. it appears to be novel, to involve an inventive step and to be industrially applicable.

1 CLAIMS

2

3 1. A hydraulically activated downhole tool for use in  
4 a well bore comprising:  
5 a hydraulically operated tool including a  
6 hydraulically operating mechanism controlled by  
7 fluid pressure; and  
8 a control sub comprising a tubular assembly having  
9 a through passage between an inlet and a first  
10 outlet, the inlet being adapted for connection on a  
11 workstring, the first outlet being adapted for  
12 connection to the hydraulically operated tool, one  
13 or more radial outlets extending generally  
14 transversely of the tubular assembly, an obturating  
15 member moveable between a first position permitting  
16 fluid flow through the one or more radial outlets  
17 and a second position closing the one or more  
18 radial outlets,  
19 wherein the obturating member is moved from the  
20 first position to the second position by a  
21 compressive force applied from the hydraulically  
22 operated tool; and  
23 movement of the obturating member regulates the  
24 fluid pressure from the first outlet to  
25 hydraulically control the hydraulically operated  
26 tool.

27

28 2. A hydraulically activated downhole tool as claimed  
29 in Claim 1 wherein a cross-sectional area of the  
30 first outlet is greater than a cross-sectional area  
31 of the second outlet.

32

33

16

- 1 3. A hydraulically activated downhole tool as claimed  
2 in Claim 1 or Claim 2 wherein the compressive  
3 force occurs from the hydraulically operated tool  
4 remaining static relative to movement of the  
5 workstring and the control sub.  
6
- 7 4. A hydraulically activated downhole tool as claimed  
8 in any preceding Claim wherein the tubular assembly  
9 comprises an inner sleeve and an outer sleeve,  
10 sealingly engaged to each other.  
11
- 12 5. A hydraulically activated downhole tool as claimed  
13 in Claim 4 wherein the outer sleeve is adapted to  
14 connect to the workstring and the inner sleeve is  
15 adapted to connect to the hydraulically operated  
16 tool.  
17
- 18 6. A hydraulically activated downhole tool as claimed  
19 in Claim 4 or Claim 5 wherein the inner and outer  
20 the sleeves include mutually engageable faces so  
21 that the sleeves may be axially slideable in  
22 relation to each other over a fixed distance.  
23
- 24 7. A hydraulically activated downhole tool as claimed  
25 in any one of Claims 4 to 6 wherein the obturating  
26 member is a sleeve, coupled to the inner sleeve of  
27 the tubular assembly.  
28
- 29 8. A hydraulically activated downhole tool as claimed  
30 in any one of Claims 4 to 7 wherein the one or more  
31 radial ports are located on the outer sleeve.  
32  
33

17

- 1 9. A hydraulically activated downhole tool as claimed  
2 in Claim 8 wherein matching radial ports are  
3 located on the obturating member such that under  
4 compression each set of radial ports align to allow  
5 fluid to flow radially from the sub.  
6
- 7 10. A hydraulically activated downhole tool as claimed  
8 in any one of Claims 4 to 9 wherein an outer  
9 surface of the inner sleeve includes a portion  
10 having a polygonal cross-section and an inner  
11 surface of the outer sleeve has a matching  
12 polygonal cross-section.  
13
- 14 11. A hydraulically activated downhole tool as claimed  
15 in Claim 10 wherein the polygonal cross sections  
16 are hex cross-sections.  
17
- 18 12. A hydraulically activated downhole tool as claimed  
19 in any preceding Claim wherein the sub includes an  
20 indexing mechanism.  
21
- 22 13. A hydraulically activated downhole tool as claimed  
23 in Claim 12 wherein the indexing mechanism  
24 comprises mutually engageable formations on the  
25 inner and outer sleeves.  
26
- 27 14. A hydraulically activated downhole tool as claimed  
28 in Claim 13 wherein the engageable formations  
29 comprise at least one pin and a slot into which the  
30 pin(s) engage.  
31
- 32 15. A hydraulically activated downhole tool as claimed  
33 in Claim 14 wherein the slot extends



18

1 circumferentially around a surface of a sleeve to  
2 provide a circumferential path for the pin.

3  
4 16. A hydraulically activated downhole tool as claimed  
5 in Claim 15 wherein the slot includes one or more  
6 longitudinal profiles as offshoots from the  
7 circumferential path to allow the sleeves to move  
8 relative to each other to effect the relocation of  
9 the obturating member from one position to another.

10  
11 17. A hydraulically activated downhole tool as claimed  
12 in any preceding Claim wherein the hydraulically  
13 operated tool is an expander tool.

14  
15 18. A method of controlling a hydraulically activated  
16 downhole tool in a well bore, the method comprising  
17 the steps:

18  
19 (a) mounting a work string, a hydraulically  
20 activated downhole tool having a hydraulically  
21 operated tool including a hydraulically operating  
22 mechanism controlled by fluid pressure, and a  
23 control sub, the sub including a first outlet to the  
24 hydraulically operated tool and one or more radial  
25 outlets through which fluid within the workstring  
26 will flow when not obstructed by an obturating  
27 member, the obturating member being moveable under a  
28 compressive force from the hydraulically operated  
29 tool;

30  
31 (b) running the hydraulically activated downhole  
32 tool into a well bore and locating the hydraulically  
33 operated tool on a formation in the well bore;

- 1  
2 (c) compressing the control sub by setting down  
3 weight on the hydraulically operated tool;  
4  
5 (d) using the compressive force to move the  
6 obturating member and thereby control the fluid flow  
7 through the radial outlets, regulating the fluid  
8 pressure from the first outlet to hydraulically  
9 control the hydraulically operated tool and thereby  
10 control the hydraulically activated tool.  
11
- 12 19. A method as claimed in Claim 18 wherein the method  
13 includes the step of running the hydraulically  
14 activated tool in the well bore with the radial  
15 outlets in an open position and circulating fluid  
16 within the well bore.  
17
- 18 20. A method as claimed in Claim 18 or Claim 19 wherein  
19 the method includes the steps of picking up and  
20 setting down the weight of the string repeatedly to  
21 cycle opening and closing of the radial outlets and  
22 thus provide a selective continuous 'on' and 'off'  
23 operation of the hydraulically activated tool.  
24
- 25 21. A method of expanding a pipe within a casing of a  
26 well bore, the method comprising the steps:  
27  
28 (a) mounting a work string, a hydraulically  
29 activated downhole tool having an expander tool  
30 controlled by hydraulic fluid pressure, and a  
31 control sub, the sub including a first outlet to the  
32 hydraulically operated tool and one or more radial  
33 outlets through which fluid within the workstring

1 will flow when not obstructed by an obturating  
2 member, the obturating member being moveable under a  
3 compressive force from the hydraulically operated  
4 tool;

5  
6 (b) running the hydraulically activated downhole  
7 tool into a well bore and locating the expander tool  
8 on the pipe;

9  
10 (c) compressing the control sub by setting down  
11 weight on the expander tool;

12  
13 (d) using the compressive force to move the  
14 obturating member and thereby prevent fluid flow  
15 through the radial outlets;

16  
17 (e) pressuring up the expander tool by fluid  
18 pressure from the first outlet; and

19  
20 (f) expanding the pipe using the expander tool at a  
21 constant fluid pressure while maintaining the  
22 compressive force on the sub.

23  
24 22. A method as claimed in Claim 21 wherein the method  
25 includes the step of running the hydraulically  
26 activated tool in the well bore with the radial  
27 outlets in an open position and circulating fluid  
28 within the well bore.

29